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EXAMINER

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ART UNIT

PAPER NUMBER

12

1762

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/424,660

Applicant(s)

Becker et al

Examiner

Katherine A. Bareford

Group Art Unit

1762



☒ Responsive to communication(s) filed on Jan. 19, 2001

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire three month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-20 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-20 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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1. The amendment of Jan. 19, 2001 has been received and entered.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

A suggested title is METHOD AND DEVICE FOR CONTROLLING THICKNESS DURING SPIN COATING.

3. The objection to the disclosure because of informalities is withdrawn due to applicant's amendments.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, line 4, after "fluid", "onto the substrate" should be inserted for clarity.

Claim 1, line 6, "a layer" should be "an applied layer" for clarity.

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Claim 1, line 9, "in response to varying variables" is confusing as worded as to what is required. One of ordinary skill in the art would not know which variables, of all the possible things that could be varied, would be ones for which change should be provided.

Claim 1, this claim does not have required positive recitation of method features of coating, since the claim does not actually perform any method steps such as coating, rotating, etc. The claims as amended provide the means for applying but no actual steps of applying.

Claim 2, line 2, "which are taken into account" is confusing as worded, because this terminology was removed from claim 1 above in the amendment.

Claim 3, line 2, "the influence of the" is confusing as worded, because this terminology was removed from claim 1 above in the amendment.

Claim 4, lines 1-2, this reference as to the formation of bond layers is confusing, since there is no requirement in claim 1 as to this formation. Furthermore, this connecting means is not required to do any connecting. This claim does not have required positive recitation of method steps, since the claim does not actually perform any method steps such as coating, rotating, etc.

Claim 5, line 2, "coating/bonding" this is confusing as worded because bonding is not provided in claim 1. Does applicant intend for this claim to depend from claim 4?

KB ~~Claim 6, line 2, "the connecting means" lacks antecedent basis since this claim depends~~
KB ~~from claim 5, not claim 4.~~

KB ~~Claim 6, line 3, "the rotary centrifugal drive" lacks antecedent basis since this claim~~
KB ~~depends from claim 5, not claim 4.~~

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Claim 10 provides for the use of claim 1, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced. Claim 10 also is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966). In the amendment of Jan. 19, 2001, applicant has amended the claim to provide "utilizing the method of claim 1", however, this is merely another way of saying the "use" of claim 1.

Claim 11 provides for the use of claim 10, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced. Claim 11 also is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim 11, lines 1-2, "the bond layer thickness" lacks antecedent basis. Also, the Examiner notes, there is no provision of a bond layer in claim 1.

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Claim 12, line 8, "varying variables" is confusing as worded as to what is required. One of ordinary skill in the art would not know which variables, of all the possible things that could be varied, would be ones for which change should be provided.

Claim 14, line 11, "variables" is confusing as worded as to what is required. One of ordinary skill in the art would not know which variables, of all the possible things that could be varied, would be ones for which change should be provided.

Claim 19, lines 3-4, it is not clarified what the adjusted deviations accomplish.

Claim 20, line 2, claim 20 provides for the use of claim 14, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced. Claim 20 also is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966). In the amendment of Jan. 19, 2001, applicant has provided "utilizing the method of claim 14", however, these is merely another way of saying the "use" of claim 14.

The other dependent claims do not cure the defects of the claims from which they depend.

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Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371^(c) of this title before the invention thereof by the applicant for patent.

7. Claim 12 is rejected under 35 U.S.C. 102(e) as being anticipated by Shiraishi et al (US 5939130).

Shiraishi teaches a device for applying coatings of viscous fluid (resist) onto planar substrates. Figure 3 and column 2, lines 10-40. Sensors are provided for measuring varying variables during coating. Figure 3 and column 5, lines 30-60, for example. Means for measuring the thickness of the coating on the substrate is provided. Figure 3 and column 5, lines 30-50 and column 6, lines 30-50. A processor for controlling coating in response to the variables and the measured thickness is provided. Column 6, lines 30-60. The processor includes a controllable rotary drive for rotating the substrate. Column 6, lines 30-60 and column 5, lines 20-30 (note the control of drive motor 16).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 14-15 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiraishi et al (US 5939130).

Shiraishi teaches a method and apparatus for applying at least one layer of a viscous fluid onto at least one planar substrate. Figure 3 and column 2, lines 10-40. The viscous fluid (resist) is provided to a dosing arm (nozzle 14 and supply pipe 18) positioned over the substrate. Figure 3 and column 5, lines 30-40 and column 7, lines 20-30. A first layer is formed on the substrate by dosing the substrate with fluid from the dosing arm. Column 7, lines 20-30. The substrate is rotated with a rotary drive. Figure 3 and column 5, lines 10-30. A thickness of the first layer formed on the first substrate is controlled by controlling the rotary speed of the rotary drive in response to variables. Column 6, lines 30-60 and column 3, lines 10-40.

Claim 15: variables include a temperature of the substrate and a temperature of the fluid. Column 6, lines 45-50 and column 5, lines 30-60.

Claim 18: the thickness of the first layer is measured. Column 7, lines 20-30. Deviations between the measured thickness and a predetermined thickness are adjusted automatically. Column 7, line 54 through column 8, line 10.

Shiraishi teaches all the features of these claims except the dosing pump to pump fluid to the dosing arm.

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However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Shiraishi to use a dosing pump to supply the fluid to the dosing arm with an expectation of similar results, because Shiraishi teaches that fluid is supplied to the dosing arm during the process, and it is the Examiner's position that a dosing pump is a conventional method for supplying fluid to a dosing arm in the art of spin coating wafers.

10. Claims 1-6, 10-11 and 13-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kashiwagi et al (US 5938891) in view of EP 595 749 A2 (hereinafter '749) and Japan 59-151424 (hereinafter '424).

Kashiwagi teaches a method and apparatus for disk bonding. Column 1, lines 1-10. Bond layers of adhesive can be applied to the surface of a disk using a dosing pump and dosing arm. Column 3, lines 50-68 and column 5, lines 10-30. The dosing arm is movable over the disk substrate. Column 5, lines 15-20. A rotary drive is provided for rotating the substrate. Column 6, lines 5-30. Kashiwagi further teaches that it is known to rotate the disk before and after a top, upper side, disk is applied to the first, lower side disk. Column 1, lines 5-25. The material to be applied can have higher or lower viscosity, which affects the treatment of the disk. Column 8, line 45 through column 9, line 15.

Claim 4, 16: a connecting means for connecting the upper and lower substrates is provided. Column 5, line 30 through column 6, line 20 and column 3, lines 50-68. A rotary centrifugal drive for spinning off excess bonding material is also provided. Column 6, lines 20-30.

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Claim 5: the system is controlled by a signal providing control unit. Column 10, lines 10-45, for example.

Claim 10, 11 and 20: the disk system can be used to make optical storage disks, such as DVD. Column 9, lines 15-20.

Kashiwagi teaches all the features of these claims except (1) measuring and testing means for variables to control thickness, (2) the computer controlling system and (3) the deviation

However, '749 teaches that when applying liquid resist to a wafer from a spray nozzle to form a thin film on the top surface of the wafer, it is conventionally known that the resist thickness resulting from the spin coating operation is dependent on the viscosity of the resist material and the spin speed. Page 2, line 55 through page 3, line 15.

'424 further teaches that when applying resist to a substrate in a spin coating process, the resist viscosity varies with temperature. See the abstract. As a result, the revolutionary speed of the motor rotating the substrate can be adjusted. See the abstract. '424 also teaches that the number of revolution of the substrate can be controlled. See the abstract.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kashiwagi to provide measurement of variables such as temperature, etc. when applying the coating as suggested by '749 and '424 with an expectation of better thickness control, because Kashiwagi teaches applying coating to a substrate to be spun and '749 teaches controlling thickness using viscosity of the coating material and spin speed, and '424 that viscosity of the coating material is affected by temperature. It further would have been obvious to use

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conventionally known computer systems to perform the controlling with an expectation of similar results, because such is a conventional method for controlling such operations. It further would have been obvious to select desired tolerances/deviations when programming such a computer, so that when to make changes would be clear.

11. Claims 7-9 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kashiwagi in view of '749 and '424 as applied to claims 1-6, 10-11 and 13-20 above, and further in view of Japan 7-29809 (hereinafter '809).

Kashiwagi in view of '749 and '424 teaches all the features of these claims except the optical sensor for noncontact measurement of coating thickness during the operation.

However, '809 teaches that it is known to use a noncontact optical sensor for measuring film thickness during coating to provide a desired film thickness and allow for automatic adjustment of the operation of the system. See the abstract.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kashiwagi in view of '749 and '424 to provide noncontact coating thickness measurement as suggested by '809 with an expectation of better thickness control, because Kashiwagi in view '749 and '424 teaches applying coating to a substrate and controlling the thickness and measurement of the coating thickness during the process as suggested by '809 would provide for better overall control of this process.

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12. The Examiner notes that EP 595 749 A2 and Japan 59-121424 (abstract) were provided with the information disclosure statement returned by the Examiner with the Rejection of July 19, 2000.

Response to Arguments

13. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (703) 308-0078. The examiner can normally be reached on Monday-Thursday from 7:00 am to 4:30 pm. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P. Beck, can be reached on (703) 308-2333.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.

Kath Bareford
KATHERINE A. BAREFORD
PRIMARY EXAMINER
GROUP 1100-1700